1. An amplification system comprising:

a power amplifier that provides an amplified output signal associated with an input signal; and

a cross cancellation component that generates a digital reference signal that is converted to an analog signal, amplified and added to the amplifier output signal to substantially reduced unwanted signals, distortion and out-of-band (OOB) emissions associated with the amplified output signal.

2. The system of claim 1, the cross cancellation component generates the digital reference signal corresponding to a desired output signal, such that an error signal is determined based on a comparison of the reference signal to the amplified output signal, and a summer that sums an inverted version of the error signal with a delayed version of the amplified output signal to provide an amplified output signal substantially free of unwanted signals, distortion and out-of-band (OOB) emissions.

3. The system of claim 1, the cross cancellation component generates a pre-computed digital signal that is converted to an analog signal, amplified and added to the amplified output signal to provide an amplified output signal substantially free of unwanted signals, distortion, and out-of-band (OOB) emissions.

4. The system of claim 1, the input signal being modified to mitigate peak signals associated with the input signal prior to amplification by the power amplifier.

5. The system of claim 4, the modification being performed by at least one of a clipping component, a filter and adding at least one signal to the input signal.

6. The system of claim 1, further comprising a predistortion component that performs predistortion on the input signal.

7. The system of claim 1, further comprising a first digital-to-analog converter (DAC) that converts the input signal from the digital domain to the analog domain to provide an analog input signal to the power amplifier, and a second DAC that has dynamic range and bandwidth properties decoupled from the first DAC, that converts the inverted version of the reference signal from the digital domain to the analog domain to provide an inverted version of an analog reference signal.

8. The system of claim 7, at least one of the first and second DACs being delta-sigma DACs, such that the at least one of the input signal and the inverted version of the reference signal are converted into the analog domain directly at a desired radio transmission frequency.

9. The system of claim 1, further comprising a coupler that combines an inverted version of the reference signal with at least a portion of the amplified output signal to generate the error signal.

10. The system of claim 1, further comprising a cancellation amplifier associated with amplification of the error signal.

11. The system of claim 1, further comprising:

a channelizer that separates a sample of the output of the amplifier into a plurality of subband output signals;

the reference signal comprising a plurality of subband reference signals compared with the corresponding plurality of subband output signals to generate a plurality of subband error signals; and

a combiner that combines the plurality of subband error signals to provide a combined error signal that is combined with the amplifier output signal to substantially reduce distortion and OOB emissions.

12. The system of claim 1, the amplification system being one of a polar amplifier, a Linear Amplification with Nonlinear Components (LINC) amplifier, an envelope tracking amplifier and a Doherty amplifier.

13. The system of claim 1, further comprising a feedback path having an analog-to-digital converter (ADC) that converts the final output signal from the analog domain to the digital domain to provide a final digital output signal to the cross cancellation component.

14. The system of claim 1, further comprising a feedback path having an analog-to-digital converter (ADC) that converts the final output signal from the analog domain to the digital domain to provide a final digital output signal to the cross cancellation component.

15. The system of claim 1, further comprising a feedback path to synchronize amplitude and phase in at least one separate path associated with converting, amplifying and adding the digital reference signal to the amplifier output signal.

16. A transmitter comprising the amplification system of claim 1.

17. A base station comprising the transmitter of claim 11.

18. An amplification system comprising:

a digital cross cancellation component that generates a reference signal associated with a digital input signal;

a modification component that modifies the digital input signal to mitigate peak signals of the digital input signal and provide a modified input signal;

an input path associated with amplification of the modified input signal to provide an amplified output signal;

a reference path associated with generating an error signal by combining an inverted version of the reference signal with an attenuated version of the amplified output signal; and

a coupler that combines an inverted version of the error signal with a delayed version of the analog output signal to generate a final output signal substantially free of out-of-band (OOB) emissions and signal distortion.

19. The system of claim 18, the input path comprising a first digital-to-analog converter (DAC) coupled to an input terminal of a power amplifier and the reference path comprising a second DAC coupled to an input terminal of a cancellation amplifier through a second coupler, the second coupler also being connected to an output terminal of the power amplifier through an attenuator.

20. The system of claim 18, further comprising:

a channelizer for providing a plurality of subband output signals from a sample of the amplifier output signal; and

a plurality of additional reference paths such that each of the plurality of subband output signals has an associated reference path to determine a subband error signal associated with a subband output signal to correct signal distortion and OOB emissions.

21. An amplification system comprising:

means for modifying a digital input signal;

means for converting the modified digital input signal into a modified analog input signal;

means for amplifying the modified analog input signal to provide an amplified output signal; and

means for adding a cancellation signal to the amplifier output signal to substantially reduced distortion and out-of-band (OOB) emissions.

22. The system of claim 21, the means for adding further comprising

means for generating an inverted version of a digital reference signal associated with a desired output signal;

means for converting the inverted version of the digital reference signal into an inverted analog reference signal;

means for combining an attenuated version of the amplified output signal with the inverted analog reference signal to generate an error signal; and

means for combining an amplified inverted version of the error signal with a delayed version of the amplified output signal to provide a final output signal substantially free of out-of-band (OOB) emissions and signal distortion.

23. The system of claim 21, the means for adding further comprising means for computing errors associated with the amplifier output signal and means for generating the reference signal to be converted, amplified, and added to amplifier output.

24. The system of claim 21, further comprising means for separating a sample of the amplifier output signal into a plurality of subbands, a plurality of means for signal distortion correction of each of the plurality of subbands and means for aggregating the plurality of corrected subbands into a combined error signal to be added to the final output signal.

25. A method of amplifying an input signal comprising:

generating a reference signal that corresponds to an inverted version of a desired output signal;

amplifying the input signal to provide an amplified output signal;

combining an attenuated version of the amplified output signal with the reference signal to generate an error signal; and

combining an inverted, amplified version of the error signal with a delayed version of the amplified output signal to provide a final output signal substantially free of out-of-band (OOB) emissions and signal distortion.

26. The method of claim 25, further comprising modifying the input signal to mitigate peak signals associated with the input signal.

27. The method of claim 26, further comprising converting the input signal and the reference signal from the digital domain to the analog domain directly to a desired radio transmission frequency.

28. A method of amplifying an input signal comprising:

amplifying an input signal to provide an amplified output signal;

separating a sample of the output signal into a plurality of subband output signals;

generating a plurality of subband reference signals;

generating subband error signals by comparing each of the plurality of subband output signals with respective subband reference signals;

combining the subband error signals to provide a combined error signal; and

combining an inverted version of combined error signal with a delayed version of amplified output signal to provide an output signal substantially free of out-of-band (OOB) emissions and signal distortion.

29. The method of claim 28, further comprising modifying the input signal to mitigate peak signals associated with the input signal.